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Nonanalytic spin susceptibility of a fermi liquid: The case of Fe-based pnictides

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Abstract

We propose an explanation of the peculiar linear temperature dependence of the uniform spin susceptibility χ(T) in ferropnictides. We argue that the linear in T term appears to be due to the nonanalytic temperature dependence of χ(T) in a two-dimensional Fermi liquid. We show that the prefactor of the T term is expressed via the square of the spin-density-wave (SDW) amplitude connecting nested hole and electron pockets. Because of an incipient SDW instability, this amplitude is large, which, along with a small value of the Fermi energy, makes the T dependence of χ(T) strong. We demonstrate that this mechanism is in quantitative agreement with the experiment.

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